REMARKS

Reconsideration and allowance of the subject application are respectfully requested. By this Amendment, Applicant has canceled claim 9. Thus, claims 1-8 are now pending in the application. In response to the Office Action, Applicant respectfully submits the pending claims define patentable subject matter.

As a preliminary matter, Applicant thanks the Examiner for acknowledging that claim 3 would be allowable if rewritten in independent form. However, Applicant respectfully requests the Examiner to hold in abeyance the rewriting of claim 3 until the Examiner has had the opportunity to reconsider the rejected parent claims in light of the arguments presented below in support of the Applicant's traverse of the rejection.

I. The Present Invention

The present invention relates to a method of fabricating an optical fiber by determining variations in the characteristics of the preform deviating from the design characteristics and modifying the diameter of the fiber during drawing as a function of the measured variations to control the transmission/propagation characteristics of the fiber. By varying the diameter of the fiber, variations or irregularities in the preform departing from its design values can be compensated in order limits the effects of the variations or irregularities in the preform on the propagation characteristics of the fiber.

Modifying the diameter of the fiber while drawing the preform re-centers the propagation characteristics in their specific ranges provided that the geometrical characteristics (the diameter of the core of the preform, the radii of the deposited layers, or the outside diameter of the

preform) or the optical characteristics (for example the indices of the various layers of the preform) diverge from their design values. The method by which the diameter is varied during drawing depends on the characteristics of the preform as measured before drawing, for example the core radius, the radii of the deposited layers, the outside radius of the preform or the indices within the preform. For conventional drawing, the fiber diameter can be varied during drawing by modifying the speed of the drawing capstan, or by modifying the rate of descent of the preform.

II. Rejection based on Matsumura

Claims 1, 6 and 9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Matsumura at al. (U.S. Patent No. 4,406,518; hereafter "Matsumura"). Applicant respectfully traverses the rejection.

Matsumura discloses a method of manufacturing single-mode fiber having a core whose refractive index distribution is non-constant but is arbitrary and a cladding whose refractive index is constant. The single-mode fiber is manufactured based upon the relationship among the refractive index distribution, the wavelength and the core radius in the case where the refractive index of the core of the optical fiber varies in a complex manner. In particular, the refractive index distribution of a preform is measured to evaluate constants X and Y. The preform is drawn from its one end at a high temperature so as to establish a drawing ratio of $(d/a)^2$ where d denotes the radius of the core of the preform and a denotes the radius of the core of the optical fiber intended to be finally obtained.

The Examiner asserts that Matsumura discloses "a method of making an optical fiber based on variations in the core diameter of a preform without altering the preform itself". However,

Applicant respectfully submits that the Examiner has mischaracterized the teachings of Matsumura. In particular, Matsumura does not teach or suggest "modifying the diameter of the fiber during drawing as a function of [determined variations in the characteristics of the preform] to compensate the effect of said variations on the propagation characteristics of the fiber", as recited in claim 1. Although Matsumura discloses measuring the refractive index distribution of the perform (i.e., makes one measure of the preform at one axial position) and establishing a drawing ratio of $(d/a)^2$ where d denotes the radius of the core of the preform and a denotes the radius of the core of the optical fiber, the cited reference does not modify the diameter of the optical fiber during drawing. Rather, the diameter (drawing ratio) of the optical fiber is set to and maintained at a constant value during drawing based on the refractive index distribution of the preform.

Accordingly, Applicant respectfully submits that independent claim 1, as well as dependent claims 6 and 9, would not have been anticipated by or rendered obvious in view of Matsumura because the cited reference does not teach or suggest all of the features of the claims.

III. Rejection based on Harding

Claims 1, 4 and 6-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Harding (U.S. Patent No. 4,793,840). Applicant respectfully traverses the rejection.

Harding discloses a method of manufacturing an optical fiber wherein as the optical fiber is drawn from a preform by a capstan, a capstan drive rate is modified by a controller in response to deviations from the nominal fiber diameter as measured by a fiber diameter monitor over short-term periods, and a preform feed rate is modified to maintain an average fiber pulling rate within .+.5% of the present pulling rate, to thus control the glass melting rate.

Although the Examiner concedes that measuring the diameter of the drawn fiber to control the drawing rate of the fiber is not the same as monitoring properties of the preform to control the drawing rate of the fiber, the Examiner cites column 2, lines 54-68 and column 3, lines 7-13 and alleges that Harding teaches drawing the optical fiber and controlling the diameter based on variations in the diameter of the preform. However, the cited sections of Harding merely disclose that a long-term capstan speed (i.e., the is calculated based on an average diameter, length and weight of preform, a short-term capstan speed (i.e., which modifies the diameter of the optical fiber) is calculated based on the measured diameter of the drawn optical fiber, and if the capstan drive speed is greater than the preform feed rate (i.e., due to an increase in the short-term capstan speed), the preform feed rate is increased to match the short-term capstan speed. Nowhere does the cited reference teach or suggest modifying the diameter of the optical fiber during drawing as a function of the determined variations in the preform, as claimed.

Accordingly, Applicant respectfully submits that independent claim 1, as well as dependent claims 4, 6 and 9, would not have been anticipated by or rendered obvious in view of Harding because the cited reference does not teach or suggest all of the features of the claims.

IV. Rejection based on Dudderar

Claims 1, 2 and 4-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Dudderar et al. (U.S. Patent No. 4,102,661; hereafter "Dudderar"). Applicant respectfully traverses the rejection.

Dudderar discloses a method for monitoring the drawdown zone of an optical fiber preform wherein caustic rays emanating from the drawdown zone are detected and analyzed to determine the geometric properties of the preform in the drawdown zone and the resultant optical fiber. Based on the determined properties of the preform in the drawdown zone and the resultant optical fiber, the diameter of the drawn fiber can be controlled.

By this Amendment, Applicant has amended claim 1 to recite "determining variations in optical or geometric characteristics of the preform departing from intended design characteristics of the preform prior to heating the preform for drawing the optical fiber." Applicant respectfully submits that Dudderar does not teach or suggest this feature of the claimed invention. That is, the present invention teaches determining the characteristics of the preform prior to the drawing process, while Dudderar teaches determining the characteristics of the preform as the preform is heated and the optical fiber is drawn therefrom.

Accordingly, Applicant respectfully submits that independent claim 1, as well as dependent claims 2 and 4-9, would not have been anticipated by or rendered obvious in view of Dudderar because the cited reference does not teach or suggest all of the features of the claims.

V. Rejection based on Abe

Claims 1, 2, 4-6 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Abe (U.S. Patent No. 6,502,429). Along with this Amendment, Applicant is submitting a verified translation of the priority document French Application No. 00 06 694 in order to perfect the priority claim of the present application under 37 C.F.R. § 1.55(a) and antedate Abe. Since Abe has an effective U.S. filing date of February 1, 2001 and the foreign priority date of the present application is May 25, 2000, the Examiner is requested to remove the § 103(a) based on Abe.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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